

I claim:

1. Apparatus for game playing, comprising:  
an image generation machine capable of driving  
a television, said image generation machine at least  
in-part controlled by a controller for controlling  
electronic imagery, said controller comprising:  
a housing structured to be held by two hands  
simultaneously, said housing having a left-hand area and  
right-hand area,  
10 a four-way rocker located in said left-hand area of  
said housing,  
a plurality of depressible buttons at least in-part  
exposed on said housing with the depressible buttons  
acting on  
15 electricity manipulating devices contained within  
said housing and controlled by depression of said  
depressible buttons for manipulating electrical outputs at  
least useful for controlling electronic imagery; at least  
one of said electricity manipulating devices is a  
20 pressure-sensitive variable-conductance sensor for  
defining an analog electrical output proportional to  
varying physical pressure applied to a depressible button  
of the plurality of depressible buttons, said button and  
said sensor are positioned in said right-hand area of said  
25 housing;  
means for outputting a signal from said controller to  
said image generation machine, said signal at least  
representational of said analog electrical output;  
said sensor comprises:  
30 circuit trace material supported by  
a sheet, said sheet located within said housing,  
a resilient dome cap positioned over said sheet and  
said circuit trace material, said resilient dome cap  
depressible by depressive pressure applied to said button.

2. Apparatus for game playing in accordance with claim 1 wherein said resilient dome cap has an underside substantially convexed surface.

3. Apparatus for game playing in accordance with 5 claim 2 wherein

said substantially convexed surface deformable to at least partially flatten-out with pressure applied to said button, the deforming of said substantially convexed surface causing electrical contact of additional surface 10 area of the circuit trace material.

4. Apparatus for game playing in accordance with claim 3 wherein said circuit trace material is in an interdigitated form in an area under said resilient dome cap, and

15 said sheet is a circuit board.

5. Apparatus for game playing in accordance with claim 4 further including conductive material contacting the interdigitated circuit trace material when said button is depressed.

20 6. Apparatus for game playing, comprising an image generation machine capable of driving an image display, said image generation machine at least in-part controlled by

25 a game controller structured to be held by a human user in two hands simultaneously, said controller comprising:

housing means for being held by the human user;

30 a plurality of depressible individual buttons exposed on said housing means and depressible by digits of the user's hands to operate

electricity manipulating devices contained within said housing means and operated for manipulating

electrical outputs of said electricity manipulating devices by depression of said depressible individual buttons; at least one of said electricity manipulating devices including

5 means for an analog electrical output proportional to varying physical pressure applied by at least one depressible individual button of the plurality of depressible individual buttons;

10 means for outputting a signal from said controller to said image generation machine, said signal at least representational of said analog electrical output.

7. Apparatus for game playing in accordance with claim 6 wherein said housing means is structured as a 15 single housing to be held by two hands simultaneously.

8. Apparatus for game playing in accordance with claim 7 wherein said means for an analog electrical output includes a resilient dome cap positioned over a first 20 circuit trace and a second circuit trace, the circuit traces are in close proximity to one another.

9. Apparatus for game playing in accordance with claim 8 further comprising

25 conductive material positioned to contact across the circuit traces when said resilient dome cap is depressed.

10. Apparatus for game playing in accordance with claim 9 wherein said resilient dome cap includes a substantially convexed portion positioned to press against 30 said conductive material when said resilient dome cap is depressed.

11. Apparatus for game playing in accordance with claim 10 wherein said convexed portion of said resilient dome cap is deformable when pressed against said 35 conductive material.

12. Apparatus for game playing in accordance with  
claim 11 further comprising

a left hand area and a right hand area of said  
housing, and said one depressible individual button is  
5 position in said right hand area.

13. Apparatus for game playing in accordance with  
claim 12 further comprising

a four-way rocker at least in part exposed on said  
housing in said left hand area.

10 14. Apparatus for game playing in accordance with  
claim 13 further comprising

four analog sensors associated with said four-way  
rocker.

15 15. Apparatus for game playing in accordance with  
claim 14 further comprising

each sensor of said four analog sensors including a  
resilient dome cap.

20 16. Apparatus for game playing, comprising  
a game console capable of controlling imagery shown by a  
television, said game console at least in-part controlled  
by

a controller, said controller comprising:

25 a housing to be grasped and held simultaneously by  
two hands of a human user; said housing including a  
right-hand area and a left-hand area, said right-hand area  
being an area for grasping by the user's right hand, said  
left-hand area being an area for grasping by the user's  
left hand;

30 a plurality of depressible individual buttons located  
on said housing in said right-hand area and positioned to  
be within reach of the user's right-hand thumb with the

user's hand grasping said housing in said right-hand area;  
at least one button of said depressible individual  
buttons including means for defining an analog electrical  
output proportional to varying applied physical pressure;  
5 means for outputting from said controller to said  
game console a signal at least representational of said  
analog electrical output.

17. Apparatus for game playing in accordance with  
claim 16 wherein said means for defining an analog  
10 electrical output comprises:

a resilient dome cap, said resilient dome cap  
positioned over  
conductive material, said conductive material  
positioned over  
15 circuit trace material.

18. Apparatus for game playing in accordance with  
claim 17 wherein said left-hand area includes a four-way  
rocker, said four-way rocker is associated with four  
electricity manipulating devices in part located on  
20 a circuit board, said circuit board continuing from  
said left-hand area into said right-hand area, said  
circuit board supporting said circuit trace material  
associated with said at least one button, said circuit  
trace material formed as interdigitated circuit traces,  
25 said resilient dome cap having a substantially convex  
shaped underside,

wherein a first level of pressure applied to said  
button causes said substantially convex shaped underside  
to contact said conductive material to a first surface  
30 area of said interdigitated circuit traces, and a second  
level of pressure applied to said button causes said  
convex shaped underside to contact said conductive  
material to a second surface area of said interdigitated  
circuit traces, said second level of pressure being

greater than said first level of pressure and said second surface area being greater than said first surface area.

19. Apparatus for game playing in accordance with  
5 claim 18 wherein said at least one button located in said  
right hand area is at least four buttons located in said  
right hand area.

20. Apparatus for game playing, comprising:

an image display for showing imagery;

10 an image generation machine capable of controlling imagery shown by said image display;

a game controller at least in part for controlling  
said image generation machine;

said game controller comprising:

15 a housing to be grasped and held simultaneously by  
two hands of a human user during use, said housing  
including a right-hand area and a left-hand area, said  
right-hand area being an area for grasping by the user's  
right hand, said left-hand area being an area for grasping  
20 by the user's left hand;

a plurality of depressible electricity manipulating devices each at least in-part exposed on said housing, at least some of said plurality of electricity manipulating devices positioned on said housing to be within reach of the user's right-hand thumb;

at least one device, of said electricity manipulating devices, includes means for creating an analog electrical signal representing varying applied physical pressure;

a resilient dome cap included in said at least one device:

a substantially convexed shaped portion of said resilient dome cap;

conductive material positioned adjacent to said substantially convexed shaped portion of said resilient dome cap;

circuit trace material positioned adjacent to said conductive material; and,

at least one of said electricity manipulating devices includes means for creating an On/Off signal;

5 each of said electricity manipulating devices electrically connected to

electronics means for at least reading the signals of said electricity manipulating devices,

means for converting the signals into control of  
10 imagery shown by said display, the signals representing at least the analog nature of said analog electrical signal, and the signals representing at least the On/Off nature of said On/Off signal.

21. Apparatus for game playing according to claim 20  
15 wherein said at least one device, and said at least one of said electricity manipulating devices, are separate devices of said electricity manipulating devices.

22. Apparatus for game playing according to claim 20  
wherein said at least one device, and said at least one of  
20 said electricity manipulating devices, is a single device of said electricity manipulating devices.

23. Apparatus for image control, comprising:  
a machine for controlling imagery, said machine at  
least in-part controlled by  
25 a hand held controller,  
said controller comprising:  
a housing shaped to be grasped and held simultaneously by two hands of a human user during use, said housing including a right-hand area and a left-hand area;  
30 a plurality of depressible electricity manipulating devices each at least in-part exposed on said housing, at least one of said electricity manipulating devices

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is a sensor, said sensor located in said right-hand area of said housing, said sensor comprising:

5        a depressible resilient dome cap positioned over electrically conductive material, variable depression of said dome cap defining an analog electrical output representing said variable depression,

active electronics means for interpreting said analog electrical output and causing variable control of the imagery.

10        24. Apparatus for image control according to claim 23 wherein said conductive material is pressure-sensitive variable-conductance material.

15        25. Apparatus for image control according to claim 23 wherein said depressible resilient dome cap has a substantially convexly rounded inner portion, said substantially convexly rounded inner portion comprising electrically conductive material.

20        26. Apparatus for image control according to claim 23 wherein said depressible resilient dome cap has a substantially convexly rounded inner portion positioned over electrically conductive material.

25        27. Apparatus for image control according to claim 26 wherein said active electronics means includes an integrated circuit chip.

27        28. Apparatus for image control according to claim 27 wherein said active electronics means includes a micro-controller.

30        29. Apparatus for image control according to claim 27 wherein said active electronics means includes an ASIC.

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30. An electricity manipulating sensor for controlling electronic imagery, said sensor comprising;  
a depressible surface area positioned to push  
a depressible resilient dome cap to apply pressure to  
5 electrically conductive material, said sensor for creating analog output proportional to varying physical pressure applied by the user's digit to said depressible surface; said sensor electrically connected to  
active electronics means for interpreting the analog  
10 output of said sensor;  
said sensor positioned as part of a two-hand held controller, said controller for controlling imagery at least in part in relation to the analog output.
31. An electricity manipulating sensor for a control device according to claim 30 wherein within said depressible resilient dome cap is a substantially convexed shaped surface area to apply pressure to said electrically conductive material.  
15
32. An electricity manipulating sensor for a control device according to claim 31 wherein said substantially convexed shaped surface area has an apex, said surface area is a rounded bulging area which is flexible, said rounded bulging area increasingly flattens with increasing pressure applied to said resilient dome cap.  
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33. An electricity manipulating sensor for a control device according to claim 32 wherein the flattening of said rounded bulging area causes additional surface area contact of said electrically conductive material with  
25 circuit trace material.  
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34. An electricity manipulating sensor for a control device according to claim 33 wherein said circuit trace

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material comprises a first circuit trace and a second circuit trace.

35. An electricity manipulating sensor for a control device according to claim 34 wherein said first circuit  
5 trace and said second circuit trace are interdigitated.

36. An electricity manipulating sensor for a control device according to claim 33 wherein said control device is a game control device including a housing to be grasped  
10 and held simultaneously by two hands of the human user during use, said housing including a right-hand area and a left-hand area, said right-hand area being an area for at least grasping by the user's right hand, said left-hand area being an area for at least grasping by the user's  
15 left hand, said depressible surface area is located in said right-hand area.

37. An electricity manipulating sensor for a control device according to claim 36 wherein said housing is a single housing, and said depressible surface area is  
20 located to be depressed by a user's right-hand thumb.

38. An electricity manipulating sensor for a control device according to claim 36 wherein said housing is a single housing, and said depressible surface area is located to be depressed by a user's right-hand index  
25 finger.

39. Game apparatus comprising:  
an image display displaying game imagery, said image display connected to  
an image generation machine, said image generation  
30 machine driving the game imagery, said image generation machine at least in-part controlled by

a controller, said controller comprising:  
a single housing to be grasped and held simultaneously by two hands of a human user, said housing including a right-hand area and a left-hand area;  
5 a plurality of depressible electricity manipulating devices each at least in-part exposed on said housing; at least one of said electricity manipulating devices including means for creating an On/Off output, and  
10 at least one of said electricity manipulating devices including a pressure-sensitive variable-conductance means for creating a varying output related to varying pressure applied by a user's right-hand digit;  
active electronics means for at least interpreting the outputs of said at least one electricity manipulating  
15 device.

40. Game apparatus according to claim 39 wherein said varying pressure is applied by the user's right-hand thumb.

41. Game apparatus according to claim 39 wherein  
20 said varying pressure is applied by the user's right-hand  
index finger.

42. Game apparatus according to claim 39 wherein a four-way rocker is located in said left-hand area.

43. Game apparatus according to claim 42 wherein  
said pressure-sensitive variable-conductance means  
includes means for establishing additional current paths,  
whereby electrical resistance is lowered according to  
pressure applied by the user's right-hand digit.

44. Game apparatus according to claim 43 wherein  
30 said pressure-sensitive variable-conductance means includes a deformable surface on an underside of a resilient dome cap.

45. Game apparatus according to claim 44 wherein said varying pressure is applied by the user's right-hand thumb.

46. Game apparatus according to claim 44 wherein  
5 said varying pressure is applied by the user's right-hand index finger.

47. Game apparatus according to claim 45 wherein said deformable surface includes an apex.